

**CLAIMS:**

What is claimed is:

1. A method comprising:
  - measuring one or more performance characteristics associated with each of at least a subset of a plurality of targets in a wireless communication system; and
  - selectively building one or more clusters, each cluster including one or more target(s) and which share wireless communication channel(s), based at least in part on the performance characteristics.
2. A method according to claim 1, wherein the performance characteristics include one or more of a signal to interference and noise ratio (SINR), a signal to noise ratio (SNR) a received signal strength indication (RSSI), a bit-error rate (BER) and/or a frame-error rate (FER).
3. A method according to claim 1, wherein each cluster is comprised of up to M targets and each communication channel accommodates up to N targets, the method of building one or more cluster(s) further comprising:
  - assigning at least a subset of up to N targets to a first communication channel resource;
  - and
  - selectively assigning subset(s) of a remaining (M-N) targets to share additional communication channel resource(s) within the cluster.
4. A method according to claim 1, wherein measuring the performance characteristics comprises:

3 initializing K sets of weights;  
4 estimating the signal to interference and noise ratio (SINR) for each target for each of the  
5 K weights; and  
6 selecting one of the K weights for each of the targets that maximizes each targets SINR,  
7 to produce K clusters of targets based, at least in part, on each target's SINR.

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2 5. A method according to claim 4, further comprising:  
3 identifying a target within each of the cluster(s) with a lowest SINR; and  
4 generating a new weight for each of the cluster(s) based, at least in part, on the SINR of  
the identified target within the cluster(s).

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6 6. A method according to claim 5, wherein the new weight is a least-squares weight  
7 associated with the identified target.

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2 7. A method according to claim 5, further comprising:  
3 estimating the performance characteristics of each of the target(s) within each of the  
4 cluster(s) using the generated new weight for each of the cluster(s); and  
5 regrouping targets according to the weights that provide the best SINR for each of the  
targets.

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2 8. A method according to claim 7, further comprising:

2           iteratively repeating the steps of identifying, generating, estimating and regrouping until  
3       no significant improvement in the estimated performance characteristics of the target(s) is  
4       identified.

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2       9.      A method according to claim 8, further comprising:  
3           selectively monitoring at least a subset of target(s) for changing performance  
4           characteristics; and  
5           iteratively repeating the steps of identifying, generating, estimating and regrouping until  
6       no significant improvement in the estimated performance characteristics of the target(s) is  
7       identified.

10.     A storage medium comprising content which, when executed by an accessing computing  
appliance, implements a method according to claim 1.

11.     A communication station comprising:  
2           wireless communication resources; and  
3           a communication agent, coupled with the wireless communication resources, to populate  
4       cluster(s) with one or more target(s) based, at least in part, on one or more estimated  
5       performance characteristics associated with the targets, and to develop a weighting value for at  
6       least a subset of the populated clusters to generate a transmission beam to target(s) within the  
7       cluster(s) based, at least in part, on the developed weighting value.

1       12. A communication station according to claim 11, wherein the wireless communication  
2 resources include at least a transmitter subsystem.

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1       13. A communication station according to claim 11, the communication agent comprising:  
2              a clustering engine, to measure one or more performance characteristics associated for  
3 each of at least a subset of a plurality of targets in a wireless communication system, and to  
4 selectively build one or more clusters, each cluster including one or more target(s) and sharing a  
5 wireless communication channel, based at least in part on the performance characteristics.

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1       14. A communication station according to claim 13, wherein the clustering engine initializes  
2 K sets of weights, estimates the signal to interference and noise ratio (SINR) for each target for  
3 each of the K weights, and selects one of the K weights for each of the targets that maximizes  
4 each targets SINR, to produce K clusters of targets based, at least in part, on each targets SINR.

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1       15. A communication station according to claim 14, further comprising the clustering engine  
2 identifies a target within each of the cluster with a lowest SINR, and dynamically generates a  
3 new set of weights based, at least in part, on the SINR of the identified target.

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1       16. A communication station according to claim 15, wherein the clustering engine calculates  
2 the new weight as a least-squares weight associated with the identified target.

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1       17. A communication station according to claim 15, wherein the clustering engine estimates  
2 the performance characteristics of each of the target(s) within each of the cluster(s) using the

3 generated new weight for each of the cluster(s), and regroups targets in clusters according to the  
4 weights that provide the best SINR for each of the targets.

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1 18. A communication station according to claim 17, wherein the clustering engine iteratively  
2 repeats the process until further re-grouping of targets fails to produce a significant improvement  
3 in the estimated performance characteristics of the targets.

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1 19. A transceiver according to claim 18, the communications agent further comprising:  
2       a beamforming engine, responsive to the clustering engine, to modify one or more  
3 attributes of a transmission signal to form a beam directed at target(s) within one or more  
cluster(s) based, at least in part, on the generated weight value(s) associated with each cluster.

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1 20. A communication station according to claim 11, further comprising:  
2       a memory subsystem having stored therein content; and  
3       control logic, coupled with the memory subsystem, to access and execute at least a subset  
of the stored content to implement the communications agent.

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1 21. In a wireless communication system implementing general packet radio services (GPRS),  
2 a method comprising:  
3       populating cluster(s) with one or more target(s) based, at least in part, on measured  
4 performance characteristics of each of the one or more target(s); and

5 developing a weighting value for at least a subset of the populated clusters to generate a  
6 transmission beam to target(s) within the cluster(s) based, at least in part, on the cluster spatial  
7 signature.

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1 22. A method according to claim 21, further comprising:

2 modifying one or more parameters of a wireless communication link signal to form the  
3 transmission beam to target(s) within the clusters based, at least in part, on the developed weight  
4 values.

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1 23. A method according to claim 22, further comprising:  
2 transmitting the formed transmission beam to an associated one or more cluster(s).

1 24. A method according to claim 21, wherein populating cluster(s) comprises:  
2 measuring one or more performance characteristics associated for each of at least a subset  
3 of a plurality of targets in a wireless communication system; and  
4 selectively building one or more clusters, each cluster including one or more target(s) and  
5 sharing a wireless communication channel, based at least in part on the performance  
6 characteristics.

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1 25. A method according to claim 24, wherein measuring the performance characteristics  
2 comprises:  
3 initializing K sets of weights;

4 estimating the signal to interference and noise ratio (SINR) for each target for each of the  
5 K weights; and

6 selecting one of the K weights for each of the targets that maximizes each targets SINR,  
7 to produce K clusters of targets based, at least in part, on each targets SINR.

1 26. A method according to claim 25, further comprising:

2 identifying a target within each cluster with a lowest SINR; and

generating a new weight for each of the cluster(s) based, at least in part, on the SINR of  
the identified target.

27. A method according to claim 26, wherein the new weight is a least-squares weight associated with the identified target.

28. A method according to claim 26, further comprising:

estimating the performance characteristics of each of the target(s) within each of the cluster(s) using the generated new weight for each of the cluster(s); and

4 regrouping targets according to the weights that provide the best SINR for each of the  
5 targets.

1 29. A method according to claim 28, further comprising:

2            iteratively repeating the steps of identifying, generating, estimating and regrouping until  
3        no significant improvement in the estimated performance characteristics of the target(s) is  
4        identified.

1    30. A storage medium comprising content which, when executed by an accessing computing  
2    device, causes the device to implement a method according to claim 21.

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